PATENT

Confirmation No. 3931

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	DURBAUM	Examiner:	Zweizig, J.
Serial No.:	10/567,396	Group Art Unit:	2816
Filed:	February 7, 2006	Docket No.:	DE030275US1 (NXPS.569PA)
Title:	OPERATION AND CIRCUITRY OF A POWER CONVERSION AND CONTROL CIRCUIT		

TRANSMITTAL

MAIL STOP APPEAL BRIEF-- PATENTS
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Customer No.
65913

Sir:

We are transmitting herewith the attached:

☒ An Appeal Brief

☒ Please charge **Deposit Account No. 50-4019 (DE030275US1)** in the amount of $540.00 for the filing of the brief in support of an appeal.

Respectfully submitted,

Please direct all correspondence to:

Corporate Patent Counsel
NXP Intellectual Property & Standards
1109 McKay Drive; Mail Stop SJ41
San Jose, CA 95131

CUSTOMER NO. 65913

By: /David A. Cordeiro/
Name: David A. Cordeiro
Reg. No.: 48,134
(NXPS.569PA)

Confirmation No. 3931

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	DURBAUM	Examiner:	Zweizig, J.
Serial No.:	10/567,396	Group Art Unit:	2816
Filed:	February 7, 2006	Docket No.:	DE030275US1 (NXPS.569PA)
Title:	OPERATION AND CIRCUITRY OF A POWER CONVERSION AND CONTROL CIRCUIT		

APPEAL BRIEF

Mail Stop Appeal Brief-Patents
Commissioner For Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Customer No.
65913

Dear Sir:

This Appeal Brief is submitted pursuant to 37 C.F.R. §41.37, in support of the Notice of Appeal filed March 23, 2009 and in response to the rejections of claims 1-15 as set forth in the Final Office Action dated December 23, 2008.

I. Real Party In Interest

The real party in interest is NXP Semiconductors. The application is presently assigned of record, at reel/frame nos. 017570/0566 to NXP, B.V., headquartered in Eindhoven, the Netherlands.

II. Related Appeals and Interferences

While Appellant is aware of other pending applications owned by the above-identified Assignee, Appellant is unaware of any related appeals, interferences or judicial proceedings that would have a bearing on the Board's decision in the instant appeal.

III. Status of Claims

Claims 1-6 and 8-14 stand rejected and are presented for appeal. Claims 7 and 15 stand objected to. A complete listing of the claims under appeal is provided in an Appendix to this Brief.

IV. Status of Amendments

No amendments have been filed subsequent to the Final Office Action dated December 23, 2008.

V. Summary of Claimed Subject Matter

As required by 37 C.F.R. § 41.37(c)(1)(v), a concise explanation of the subject matter defined in the independent claims involved in the appeal is provided herein. Appellant notes that representative subject matter is identified for these claims; however, the abundance of supporting subject matter in the application prohibits identifying all textual and diagrammatic references to each claimed recitation. Appellant thus submits that other application subject matter, which supports the claims but is not specifically identified above, may be found elsewhere in the application. Appellant further notes that this summary does not provide an exhaustive or exclusive view of the present subject matter, and refers to the appended claims and their legal equivalents for a complete statement of the invention.

As relevant to claim 1, an example embodiment of the present invention is directed to an electronic circuit comprising a first MOSFET and a second MOSFET that are arranged parallel to each other, a temperature sensor and a MOSFET resistance control circuit. See, for example, items 6, 8, 34 (or 36) and 30 of Figure 4 and the discussion at paragraphs 0037-0041. The first and second MOSFETs respectively have first and second resistances when they are switched on. The temperature sensor measures at least one of a first temperature of the first MOSFET and a second temperature of the second MOSFET (*see*, *e.g.*, items 34 and 6, 36 and 8 of Figure 4). The MOSFET resistance control circuit individually controls at least one of the first resistance of the first MOSFET and the second resistance of the second MOSFET based at least partly on measured temperature provided from the temperature sensor (*see*, *e.g.*, paragraph 0038).

As relevant to claim 5, another example embodiment of the present invention is directed to an electronic circuit comprising a first MOSFET and a second MOSFET arranged parallel to each other, a MOSFET resistance control circuit and a temperature sensor. See, for example, items 6, 8, 34 (or 36) and 30 of Figure 4 and the discussion at paragraphs 0037-0041. The first and second MOSFETs respectively have a first and second resistance when they are switched on. The temperature sensor measures at least one of first and second temperatures respectively of the first and second MOSFETs (*see*, *e.g.*, items 34 and 6, or 36 and 8 of Figure 4). The MOSFET resistance control circuit comprises a gate voltage control circuit that individually controls at least one of first and second gate voltages respectively of the first and second MOSFETs on the basis of the at least one of the first and second temperatures, to respectively control at least one of the first resistance of the first MOSFET and the second resistance of the second MOSFET (*see*, *e.g.*, paragraph 0038).

As relevant to claim 10, another example embodiment of the present invention is directed to a method of operating a first MOSFET and a second MOSFET arranged parallel to each other, with the first and second MOSFETs respectively having first and second resistances when they are switched on. See, for example, items 6 and 8 of Figure 4 and the discussion at paragraphs 0037-0041. At least one of the first resistance of the first MOSFET and the second resistance of the second MOSFET is individually controlled based on a

temperature measurement of at least one of the first and second MOSFETs (*see*, *e.g.*, paragraph 0038).

VI. Grounds of Rejection to be Reviewed Upon Appeal

The grounds of rejection to be reviewed on appeal are as follows:

A. Claims 1-6, 8 and 10-14 stand rejected under 35 U.S.C. § 102(b) over the Osborn reference (U.S. Patent No. 5,796,278).

B. Claim 9 stands rejected under 35 U.S.C. § 103(a) over the Osborn reference in view of the Shreve reference (U.S. Patent No. 6,100,728).

VII. Argument

All of the rejections should be reversed because the Office Action has failed to show correspondence to all claim limitations, and because the rejections rely upon unsupported and erroneous assertions that a resistor is necessarily (inherently) a temperature sensor as claimed, and that an output from the resistor somehow provides an accurate representation of temperature. These assertions are clearly erroneous because the cited resistor exhibits voltage characteristics that are wholly independent from any temperature, nothing in the record establishes that the cited resistor must necessarily operate as the claimed temperature sensor, and nothing in the record would suggest that the voltage at the cited resistor would or could provide a temperature measurement output as claimed.

While each of the above grounds of rejection is discussed separately below, resolution of the first ground of rejection below in favor of the Appellant renders the other grounds of rejection (over asserted art) moot. As the Examiner's allegations of inherency are unfounded, and as the cited references fail to disclose those limitations asserted to be "inherent" and/or any related temperature-based functionality to the claimed invention, all of the §§ 102 and 103 rejections are improper and should be reversed. The following discussion addresses these matters in greater detail.

A. The § 102(b) Rejection Of Claims 1-6, 8 And 10-14 Must Be Reversed

1. The Examiner's Unsupported Allegations Of Inherency Violate The M.P.E.P. And Relevant Law

The § 102 rejections rely upon a flawed theory of inherency that is based on the Examiner's "view," which fails to establish that various undisclosed limitations are necessarily present in the cited reference or that the cited reference would necessarily operate as claimed, and which is further based upon a technically incorrect interpretation of basic transistor operation. As indicated by M.P.E.P. § 2112, to establish inherency, the extrinsic evidence must make clear that missing descriptive matter is *necessarily* present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient to support a § 102 rejection.

In this instance, the Examiner's "view" that resistor 222 in Figure 4 of the '278 reference is the claimed temperature sensor is based upon an unsupported assertion that the resistor 222 "provides a voltage value that is directly dependent upon a current through transistor 210, which is directly related to the temperature of transistor 222" and further that the voltage thus measures temperature as claimed. Appellant notes that while there is no such "transistor 222," the Office Action has not established that any relationship between the voltage value at resistor 222 and the temperature of any transistor must necessarily depend upon transistor temperature, that the voltage at resistor 222 would necessarily provide an accurate measurement of temperature, or that the cited circuit would thus necessarily operate based upon measured temperature in accordance with the claimed invention. As well understood in the relevant art, the current through a transistor may depend upon a variety of factors that are not dependent solely upon temperature, such as the electric field, strain and other factors. Neither the cited reference nor the Office Action provides any explanation whatsoever as to how the resistor 222 would or could be used to extract that portion of its response relating to any change in temperature from its response to other factors.

The Examiner's "view" is further silent as to how the cited circuit in Figure 4 somehow also necessarily uses the sensed voltage at resistor 222 as a measure of

temperature, and how the other circuitry in Figure 4 would then operate based on measured temperature. That is, where the voltage at resistor 222 may fluctuate in any manner that is not solely based upon temperature (consistent with the above), the voltage does not provide a consistent or accurate measure of temperature. Accordingly, the resistor 222 does not necessarily operate for measuring temperature as claimed, and would accordingly be useless in providing a measured temperature that can accurately be used in controlling circuit operation.

In view of the above, the Examiner's "view" in asserting that the resistor 222 is necessarily a temperature sensor as claimed, and that it can further operate to provide an accurate measure of temperature in accordance with the claimed invention, is unsupported in the record and contrary to well understood operation of transistors. The § 102 rejections must therefore be removed.

2. The '278 Reference Fails To Disclose All Of The Limitations In Each Of Claims 1-6, 8 And 10-14

Consistent with the above discussion, the resistor 222 is not a temperature sensor as claimed because the resistor is susceptible to conditions that are not necessarily dependent upon temperature and/or is responsive in a manner that is not necessarily indicative of a measurement of temperature. That is, the § 102 rejection relies upon the voltage at the resistor 222 being "directly dependent on a current through transistor 210" and further that the current in transistor 210 depends on the temperature of the transistor. The '278 reference uses maintains the ratio of load current to current through the transistor 210 at a "target current ratio ... to reproduce the I_L waveform produced by circuit 10." In this regard, neither the voltage at the resistor 222 nor the current at the transistor 210 are wholly dependent upon temperature as asserted, in a manner that would provide correspondence to the claimed temperature sensor.

Beginning with the voltage (V_{SNS}) across resistor 222, the cited portions of the '278 reference do not teach that the voltage V_{SNS} is directly dependent on the current through transistor 210 as asserted. Instead, the voltage V_{SNS} across resistor 222 is taught as also being dependent on the load current I_L ("As I_L increases through R_{SNS} 222, V_{SNS}

correspondingly increases."). *See, e.g.,* Figure 4 and Col. 7:55-62. As such, the '278 reference teaches that the voltage V_{SNS} across resistor 222 can change irrespective of the current through transistor 210 (*i.e.,* voltage V_{SNS} can change without the current through transistor 210 changing).

Regarding the current (I_{SNS}) at transistor 210, the cited portions of the '278 reference do not teach that this current I_{SNS} is directly related to the temperature of the transistor. Rather, the current I_{SNS} is taught as also being dependent on the variable current I_1, which is used to drive transistor 210. Current I_{SNS} is further dependent upon the voltage V_1 that is used to "drive the gate 216 of transistor 210 at a decreased level" (*see, e.g.*, Figure 4 and column 7:63-8:2). As such, the '278 reference teaches that the current through transistor 210 can change irrespective of the temperature of the transistor 210 and is further used in a completely unrelated manner.

In addition to the above, the Examiner has not established that the circuit in Figure 4 would operate in accordance with claim limitations directed to controlling the resistance of a MOSFET based upon measured temperature. As established in the record, the cited portions of the '278 reference teach that the feedback arrangement of Figure 4 is used to lower current I_1 when the load current I_L exceeds a certain value. *See, e.g.,* Col. 7:54 to Col. 8:2. This lowering of current may be independent from temperature, and at the very least is not referenced as being relative to any temperature. The feedback arrangement of Figure 4 thus does not necessarily possess "inherent temperature stability properties" because a change in the temperature of transistor 210 does not necessarily result in the adjustment of current I_1.

In view of the above, the resistor 222 does not provide a measure of temperature as asserted by the Examiner and, more importantly, does not provide a measure of temperature as claimed. Moreover, the feedback circuit in Figure 4 does not operate to control the resistance of a MOSFET in response to temperature. Applicant therefore submits that the § 102 rejections of claims 1-6, 8 and 10-14 should be reversed.

3. The '278 Reference Fails To Disclose All Of The Limitations In Each Of Claims 7 And 15

Applicant further submits that any rejection of claims 7 and 15, as applicable via the above rejections to the claims from which they respectively depend, are improper for reasons stated above and are further inapplicable because the objections are without any legal basis. That is, the objections rely upon an erroneous assertion that the claim dependencies are incorrect due to the recitation of a "second" preset value, where no "first" preset value is recited. The Examiner has provided no rationale upon which these assertions are based. It appears that the Examiner is confused because other dependent claims refer to a "first" preset value. However, it does not necessarily follow that any second preset value be contemplated with a first value (or, for example, that the first or second values be related as suggested by the Examiner).

Appellant attempted to address the Examiner's confusion by deleting the term "second" from the phrase "second preset value" in the respective claims, yet this amendment was rejected based upon an assertion that the amendment "would broaden the scope of the claims." As the claim had not previously defined what a "second" preset value was or how such a value is different from any preset value not bearing the adjective "second" or otherwise characterizing the adjective (*i.e.*, as something different than a "first" value), the Examiner's assertions are unfounded. The Examiner's assertions regarding enablement are similarly unfounded.

As Appellant cannot ascertain any basis for the rejection in the M.P.E.P. and relevant law, the objection to claims 7 and 15 is believed to be inapplicable. Moreover, as the rejections of the underlying claims from which claims 7 and 15 respectively depend are improper per the above discussion in Section A, Appellant requests that all rejections as applicable to claims 7 and 15 be reversed.

4. The Examiner Failed To Address Appellant's Rebuttal Of The Asserted Allegations Of Inherency

The Appellant rebutted the Examiner's unsupported "view" by establishing in the record that the resistor 222 is not necessarily the claimed temperature sensor. Specifically, the Appellant stated:

> Specifically, the voltage V_{SNS} across resistor 222 does not provide any reliable indication of the temperature of transistor 210 since the voltage V_{SNS} can change irrespective of any change in the temperature of transistor 210. *See, e.g.,* McGraw-Hill Dictionary of Scientific and Technical Terms, 6th edition (Temperature Sensor: "A device designed to respond to temperature stimulation."), http://www.answers.com/topic/temperature-sensor. As such, the skilled artisan would not reasonably interpret resistor 222 as being a temperature sensor that measures the temperature of transistor 210 since the cited portions of the '278 reference do not teach that the temperature of transistor 210 can be determined from the voltage V_{SNS} across resistor 222.

Rather than address Appellant's traversals or other wise address the lack of disclosure of any temperature sensing, the Examiner stated in response:

"see previous Office Action."

Appellant submits that this response amounts to ignoring Appellant's traversals and contrary to the requirements of M.P.E.P. § 2112, which recite that the Applicant may rebut the Examiner's assertions of inherency and establish nonobviousness by proving that "the prior art products do not necessarily or inherently possess the characteristics of his [or her] claimed product." In this instance, the Appellant has provided clear explanation as to various examples that demonstrate that the voltage across resistor 222 and/or the current through the transistor 210 do not necessarily (and accurately) measure temperature as claimed.

In view of the above, Appellant has established in the (uncontroverted) record that the cited resistor 222, which provides a voltage based upon current, is not a temperature sensor as claimed in the instant invention. Accordingly, the record does not support the Examiner's "view" regarding allegedly inherent functions, and therefore does not support the § 102 rejections. The § 102 rejections should therefore be reversed.

B. The § 103(a) Rejection Of Claim 9 Must Be Reversed Because There Is No *Prima Facie* Case Of Obviousness

Claim 9 depends from claim 1 and as such is believed to be allowable for reasons stated above in connection with Section A. That is, the assertions of inherency violate the M.P.E.P. and relevant law, the cited references do not correspond as asserted, and the Examiner failed to address Appellant's rebuttal of the allegedly inherent functions.

Specifically relative to the limitations in claim 9, the rejection relies upon an assertion that, simply because some "FET" is used in an automotive application, that the FET used in the '278 reference would somehow be configured to do so is untenable. Moreover, the Examiner's attempt to assert motivation for combining the references is completely devoid of any discussion relative to the cited references. That is, the Examiner's alleged motivation is:

> All the claimed elements were known in the Prior Art and one skilled in the art could have combined the elements as claimed by known methods with no changes in their respective functions, and the combination would have yielded predictable results to one of ordinary skill in the art at the time of the invention

This alleged "motivation" is without any factual or contextual basis, and if applied here, would be applicable to any and all combinations of all references, effectively rendering any combination obvious, contrary to § 103 and the meaning behind the law as a whole. For instance, the Examiner has provided no explanation as to how one skilled in the art "could have combined the elements" as no description whatsoever has been provided as to how such a combination would be made. The Examiner further provided no explanation as to how the references could be combined "with no changes in their respective functions." The Examiner also failed to explain what any "predictable results" would have been.

In short, the Examiner has violated all aspects of § 103 requiring that there be some motivation for combining references, some likelihood of success in doing so. Moreover, the proposed combination of references does not teach or suggest the claimed invention, as consistent with the discussion in Section A above. Appellant therefore requests that the rejections be reversed.

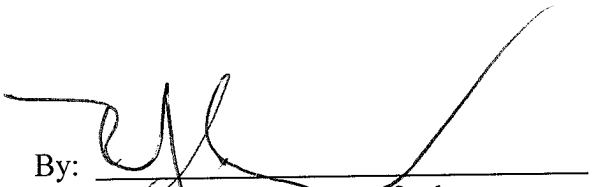
VIII. Conclusion

In view of the above, Appellant submits that the rejections of claims 1-15 are improper and therefore requests reversal of the rejections as applied to the appealed claims and allowance of the entire application.

Please direct all correspondence to:

Corporate Patent Counsel
NXP Intellectual Property & Standards
1109 McKay Drive; Mail Stop SJ41
San Jose, CA 95131

CUSTOMER NO. 65913

By: 

Name: Robert J. Crawford
Reg. No.: 32,122
Eric J. Curtin
Reg. No.: 47,511
651-686-6633
(NXPS.569PA)

APPENDIX OF CLAIMS INVOLVED IN THE APPEAL
(S/N 10/567,396)

1. Electronic circuit, comprising: a first MOSFET and a second MOSFET; wherein the first MOSFET and the second MOSFET are arranged parallel to each other; wherein the first MOSFET has a first resistance when it is switched on and the second MOSFET has a second resistance when it is switched on; a temperature sensor for measuring at least one of a first temperature of the first MOSFET and a second temperature of the second MOSFET; and a MOSFET resistance control circuit for individually controlling at least one of the first resistance of the first MOSFET and the second resistance of the second MOSFET based at least partly on measured temperature provided from the temperature sensor.

2. The electronic circuit of claim 1, wherein the MOSFET resistance control circuit comprises a gate voltage control circuit for individually controlling at least one of a first gate voltage of the first MOSFET and a second gate voltage of the second MOSFET to control at least one of the first resistance of the first MOSFET and the second resistance of the second MOSFET.

3. The electronic circuit of claim 2, wherein the gate voltage control circuit controls the at least one of the first and second voltages such that at least one of the first and second resistances, first and second currents flowing through the first and second MOSFETs and first and second temperatures of the first and second MOSFETs are adjusted to each other.

4. The electronic circuit of claim 2, further comprising a current measuring unit for measuring at least one of a first current flowing through the first MOSFET and a second current flowing through the second MOSFET; wherein the gate voltage control circuit is adapted to individually control the at least one of the first and second voltages on the basis of at least one of the first and second currents.

5. Electronic circuit, comprising: a first MOSFET and a second MOSFET; wherein the first

MOSFET and the second MOSFET are arranged parallel to each other; wherein the first MOSFET has a first resistance when it is switched on and the second MOSFET has a second resistance when it is switched on; and a MOSFET resistance control circuit for individually controlling at least one of the first resistance of the first MOSFET and the second resistance of the second MOSFET;

wherein the MOSFET resistance control circuit comprises a gate voltage control circuit for individually controlling at least one of a first gate voltage of the first MOSFET and a second gate voltage of the second MOSFET to control at least one of the first resistance of the first MOSFET and the second resistance of the second MOSFET; and

a temperature sensor for measuring at least one of a first temperature of the first MOSFET and a second temperature of the second MOSFET; wherein the gate voltage control circuit is adapted to individually control the at least one of a first and second voltages on the basis of the at least one of the first and second temperatures.

6. The electronic circuit of claim 5, wherein the gate voltage control circuit controls the at least one of a first and second voltages only when one of the first and second temperatures exceeds a first preset threshold value.

7. The electronic circuit of claim 5, wherein the temperature sensor is adapted for measuring the first temperature and the second temperature; and wherein the gate voltage control circuit controls the at least one of a first and second voltages only when a difference of the first and second temperatures exceeds a second preset value.

8. The electronic circuit of claim 1, wherein the first resistance of the first MOSFET is the RDSon of the first MOSFET and the second resistance of the second MOSFET is the RDSon of the second MOSFET.

9. The electronic circuit of claim 1, wherein the electronic circuit is a power module in particular for the use in automotive applications.

10. Method of operating a first MOSFET and a second MOSFET, wherein the first MOSFET and the second MOSFET are arranged parallel to each other, wherein the first MOSFET has a first resistance when it is switched on and the second MOSFET has a second resistance when it is switched on, the method comprising the step of: individually controlling at least one of the first resistance of the first MOSFET and the second resistance of the second MOSFET based on a temperature measurement of at least one of the first and second MOSFETs.

11. The method of claim 10, further comprising the step of: individually controlling at least one of a first gate voltage of the first MOSFET and a second gate voltage of the second MOSFET to thereby control at least one of the first resistance of the first MOSFET and the second resistance of the second MOSFET such that the first and second resistances are adjusted to each other.

12. The method of claim 11, further comprising the steps of: measuring at least one of a first current flowing through the first MOSFET and a second current flowing through the second MOSFET individually controlling the at least one of the first and second voltages on the basis of at least one of the first and second currents and the at least one temperature measurement.

13. The method of claim 11, further comprising the steps of: measuring at least one of a first temperature of the first MOSFET and a second temperature of the second MOSFET; individually controlling the at least one of a first and second voltages on the basis of the at least one of the first and second temperatures.

14. The method of claim 13, further comprising the step of: controlling the at least one of a first and second voltages only when one of the first and second temperatures exceeds a first preset threshold value.

15. The method of claim 13, further comprising the steps of: measuring the first

temperature and the second temperature; and individually controlling the at least one of a first and second voltages only when a difference of the first and second voltages exceeds a second preset value.

APPENDIX OF EVIDENCE

Appellant is unaware of any evidence submitted in this application pursuant to 37 C.F.R. §§ 1.130, 1.131, and 1.132.

APPENDIX OF RELATED PROCEEDINGS

As stated in Section II above, Appellant is unaware of any related appeals, interferences or judicial proceedings.